

AMENDMENTS TO THE SPECIFICATION

Please replace Paragraphs [0007] and [0036] with the following paragraphs rewritten in amendment format:

[0007] In one preferred form the present invention comprises a tubular waveguide structure having a tapering internal surface. A dielectric insert is disposed within the tubular waveguide structure. The dielectric insert has an outer surface. The inner surface of the waveguide structure and the outer surface of the dielectric insert cooperatively form an annular, tapering transition region for channeling electromagnetic wave energy between the waveguide structure and an antenna aperture. At least one of the internal surface of the waveguide structure or the outer surface of the dielectric insert is non-linear (i.e., non-flat), and thus forms a non-linear (non-flat) profile. In one preferred embodiment, the dielectric insert includes a gradually curving outer surface that forms a gradually curving, conical shape when viewed in profile. In another preferred embodiment the dielectric insert includes a plurality of distinct, linear sections disposed adjacent one another that form an overall, non-linear (i.e., non-flat) shape.

[0036] The non-linear (i.e., non-flat slightly curving) profile formed by outer surface 128 of dielectric insert 118 provides significant benefits to the performance of the waveguide 100. These are visible in Figure 5. With brief reference to Figure 5, dashed lines 130 define an operating frequency bandwidth therebetween. Curve 132 shows the cut-off frequencies produced by the waveguide 100 over the length of its transition region 112. The cut-off frequencies produced by the waveguide 100 at all points along the transition region 112 remain below the operating frequency bandwidth 130. This is in contrast to the cut-off frequencies produced by conventional antenna 10

as shown in Figure 2, which extend into the operating frequency bandwidth defined in Figure 2. The “flatter” frequency cut-off performance of the waveguide 100 allows the operating frequency bandwidth 130 to be selected closer to the cut-off frequencies of the waveguide than is possible with previously designed waveguides.